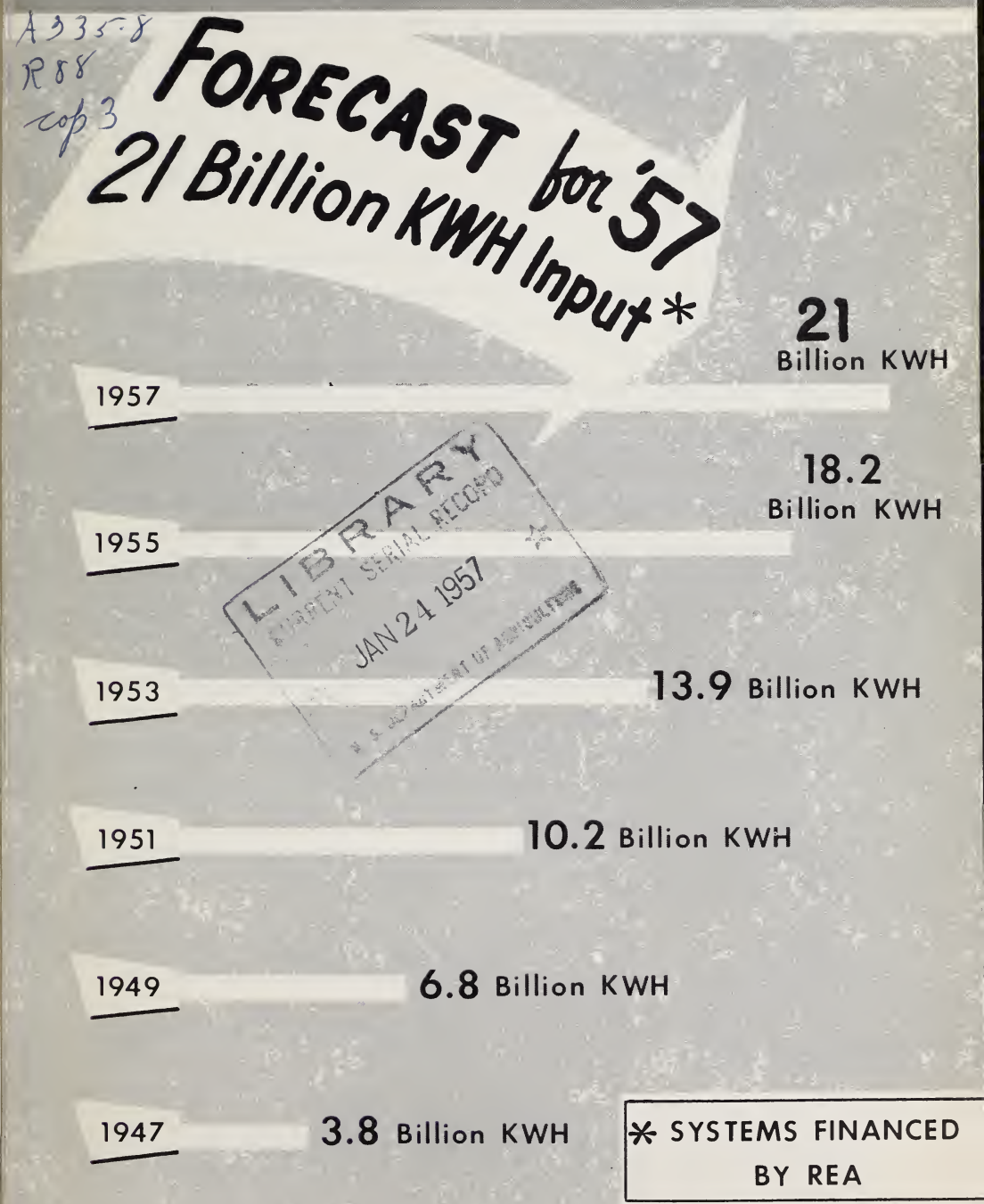
# Rural Lines

JANUARY 1957

RURAL ELECTRIFICATION ADMINISTRATION • U. S. DEPARTMENT OF AGRICULTURE




## FORECAST for '57
## 21 Billion KWH Input*



## *A Message from the* ADMINISTRATOR

DURING 1957 rural electric cooperatives will be called upon to furnish more power than ever before to their consumer-members.

Featured on the cover and elsewhere in this issue is the REA estimate of a net input of 21 billion kilowatt-hours in the distribution lines of our borrowers this year.

The number of electrified farms is nearing the saturation point. But it is my firm belief that our farmers and ranchers are just beginning to realize the great potential of electric power. With greater and more productive use of power for agricultural purposes and with thousands of new non-farm homes coming on the lines, the kwh demand will continue to rise year after year.

REA's estimates of future power needs have usually been on the conservative side. The same may be true of our 1957 forecast.

You rural folks who direct our cooperatives will naturally ask yourselves: "Is our co-op prepared to deliver to our consumers, efficiently and economically, all the electric power they need?" You directors long ago willingly assumed the work and responsibility of bringing electric power for the first time to your farm neighbors. I believe you will just as willingly accept the responsibility of assuring an adequate, economical supply of power in the future.

David A. Hamil

*Administrator.*

Issued monthly by the Rural Electrification Administration, U. S. Department of Agriculture, Washington 25, D. C. Subscribe to this publication from the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C. Price, $1.50 a year; foreign, $2 a year; single copies, 15 cents. Printing of this publication has been approved by the Director of the Bureau of the Budget, January 25, 1954 ● Vol. 3, No. 8.

# REA Forecast For '57—
# 21 Billion KWH Input

## Numerous Factors Involved
## In Estimating Power Requirements

A NET input of 21 billion kilowatt-hours is estimated in 1957 for rural electric systems financed by REA. This is 2.8 billion kwh more than 1955's actual input.

The bar graph on our cover gives a striking picture of kwh growth among REA electric borrowers during the past 10 years. It emphasizes the view frequently expressed by Administrator David Hamil that, while area coverage may be approaching the saturation point, electric power usage in rural areas will hit ever-increasing highs.

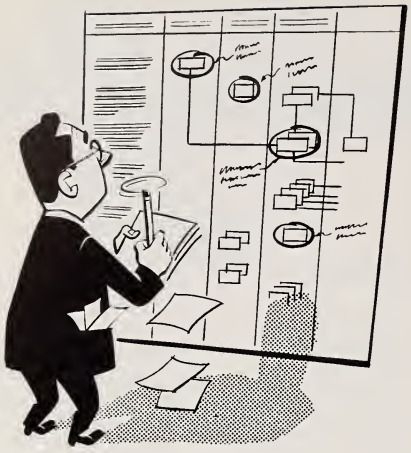
REA distribution borrowers have been experiencing a two-pronged growth, in the number of consumers served and in the average kwh per consumer. In the box below are the figures for this growth since 1947.

REA makes continuing studies of electric power usage in rural areas, estimating future needs in order that borrowers will have a realistic basis for planning and the Administration a guide for its course of action. Following is a brief discussion of the general processes by which long-range power requirement estimates are made.

Forecasting rural electric requirements is a complex job involving many different factors, all of which must be properly evaluated in arriving at dependable figures for the future.

Even the estimate of the number of future consumers on the cooperative lines becomes an elusive figure as the nature of our countryside changes. The number of unelectrified farms is fairly accurately known, and this could be expected to be a firm basis for predicting the number of prospective new consumers. However, in recent years there has been an unprecedented movement of residents and industries to rural

| | Consumers Connected | Avg. Monthly KWH Per Consumer |
|---|---|---|
| 1955 | 4.2 million | 306 |
| 1953 | 3.9 " | 254 |
| 1951 | 3.6 " | 206 |
| 1949 | 3.0 " | 166 |
| 1947 | 2.0 " | 138 |



areas. The result is that the total number of rural consumers has been increased by an influx of new people that could hardly have been foreseen several years ago.

Even a forecast of the electric power requirements of present rural consumers becomes an involved process that is affected by a number of factors. Among these —not listed in the order of their importance, for they exert different degrees of influence under different conditions—are:

**Level of farm income**
**Kind and size of farms**
**Length of time with electric service**
**Retail rates of electricity**
**Competition from other energy sources**
**Adequacy of the electric service**
**Power use promotional efforts**

Other factors may also have marked effect on the use of electricity in specific areas, and the forecaster is required to give them proper weight in making his estimates. For instance, it is a known fact that the size of families affects the use of electricity and that in a given area, other factors being equal, the larger farm family uses more electricity. But even this simple fact becomes complicated, because it is equally true that a large family in one section of the country may not use as much electricity as a small family in another area.

So many pitfalls face the forecaster that the job of estimating future power needs is almost an art, requiring many decisions based on judgment, rather than an exact science. For instance, the level of farm income is one of the more important factors affecting the use of electricity. But if any unwary forecaster should overlook the fact that off-farm employment is a significant source of income to farm operators in many areas, then his conclusions would be faulty.

In estimating future power requirements, some knowledge of future appliance purchases is needed. Conducting surveys of present and planned use of appliances and properly applying the findings to power use forecasts require a high degree of specialized knowledge.

The above is a brief outline of some of the important considerations covered in forecasting kwh

input on the systems financed by REA. All the factors must be properly correlated and given their correct weight according to geographical location, specialized local conditions, changing types of farm activity and other variable elements.

# Big Units Go On Lines In 1957

TWO prime movers capable of generating more than a billion kilowatt-hours every twelve months will be placed in service this spring to help provide a portion of the additional power needed by REA electric borrowers during 1957 (See page 3).

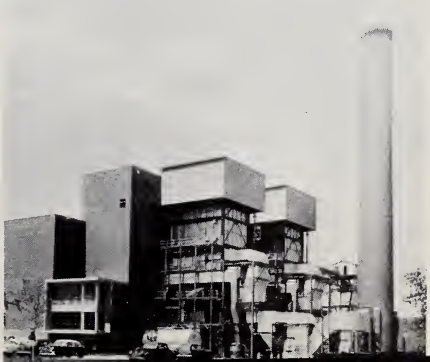
The 66,000-kw unit of the East Kentucky Rural Electric Cooperative Corporation and the 50,000-kw unit of the Dairyland Power Cooperative are the first steam generating units in the 50,000-kw and over class to be constructed with REA loan funds. Two 30,000-kw steam units—in Nebraska and Wisconsin—presently share the distinction of being the largest operating steam generating units made possible by REA loans.

Two small steam generating units also will begin feeding power into lines of REA borrowers during 1957. The Chugach Electric Association expects to have its new 5000-kw steam unit in service by February at its Anchorage, Alaska, plant. Then in August, the Southwestern Federated Power Cooperative is expected to begin operation of its third 7500-kw steam unit at its Creston, Iowa, station.

Growing loads and the economics of power generation are operating to place even larger generating units in the rural power network. REA recently approved a loan for construction of a 100,000-kw single unit steam generating station near Lexington, Nebraska. Target date for operation of this unit is March, 1958.

East Kentucky's 66,000-kw unit will be the third at its William C. Dale station near Ford, Kentucky. The plant was opened in December, 1954, with two 20,000-kw steam units.

Dairyland has been moving up the generating scale ever since it obtained the first REA loan for a steam-driven power plant. This was in 1939 and the loan enabled the young G-T cooperative to install two 3000-kw units alongside the Mississippi river at Genoa, Wisconsin. After adding two additional small 4000-kw steam units at Genoa, Dairyland graduated to 15,000-kw steam units in 1947. After installing four units of this size, it stepped up to a 30,000-kw unit in 1954. The new 50,000-kw unit is being installed alongside three 15,000-kw units at the Alma station. When the new unit is operating, Dairyland will have a total installed generating capacity of 186,620 kilowatts, largest among REA borrowers.



**East Kentucky's William C. Dale generating station at Ford, Kentucky.**

# 4-H Electric Winners

FOUR youngsters living on farms or ranches served by REA electric borrowers were among the six winners of national honors in the 1956 4-H Club Electric Program conducted by the Extension Services of State Agricultural Colleges and the U. S. Department of Agriculture.

The national winners were presented with $300 college scholarships by the Westinghouse Electric Educational Foundation at the 4-H Club Congress in Chicago last November.

Top award winners and their prize-winning projects were:

**JoAnn Raber,** 17, Whitewater, Colorado, only girl receiving national honors, constructed a water cooled air conditioner for the calf barn on her father's ranch, using castoff materials. Her family's ranch gets its electric power from the Grand Valley Rural Power Lines, Grand Junction.

**Kenneth E. Krause,** 18, Kilbourne, Illinois, wired the Mason County 4-H show buildings, in addition to rewiring a house and barn. The Krause family is served by the Menard Electric Cooperative, Petersburg.

**Merwyn Eshelman,** 17, Centerville, Washington, constructed among other things 19 pig and lamb brooders, an electrically heated stock watering trough, electric hotbed and room ventilating fan. PUD No. 1 of Klickitat County, Goldendale, supplies the Eshelman farm with electricity.

**National winners in 1956 4-H Club Electric Program inspect pea sheller designed and made by one of contestants. Left to right, Kenneth .Krause, Don Jeans, Andrew Kasznay, Jr., JoAnn Raber, Robert Harris, Merwyn Eshelman.**

**Don Jeans,** 17, Ponca City, Oklahoma, made an electric hay loader and completed 179 other jobs, including helping with the wiring on his father's farm. His family is served by the Kay Electric Cooperative, Blackwell.

The two other national winners were **Robert Harris,** Bessemer, Alabama, and **Andrew J. Kasznay, Jr.,** Torrington, Connecticut.

Following are the state winners whose families are served by REA electric borrowers:

**Roy E. Baker, Jr.,** Blytheville, Ark.—Mississippi County Elec. Co-op.
**Marilyn Joyce Cox,** Stark, Fla.—Clay Electric Co-op.
**Gerald Johnson,** New Hampton, Ia.—Butler County Rural Elec. Co-op.
**Richard Shuster,** Jewell, Kan.—Jewell Mitchell Cooperative Elec. Co.
**Parker Ray Blevins,** Monticello, Ky.—South Kentucky Rural Elec. Co-op.
**Wesley Sunvold,** Sacred Heart, Minn.—Renville Sibley Co-op Power.
**Charles Loyal Bray,** Thaxton, Miss.—North East Mississippi Elec. Power.
**Ronald S. Dingus,** Appleton City, Mo.—Osage County Elec. Co-op.
**Stanley Rogers,** Artesia, N. Mex.—Central Valley Electric Co-op.
**Jo Ann Gibbs,** Laurens, S. Car.—Laurens Electric Co-op.
**Karel M. Engel,** Aurora, S. Dak.—Sioux Valley Empire Elec. Assoc.
**Margaret Louise Thompson,** Trenton, Tenn.—Gibson County EMC.
**Jo Beth Stubblefield,** Hale Center, Tex.—South Plains Electric Co-op.
**Rozel Skaaland,** Viroqua, Wisc.—Vernon Electric Co-op.

# Demonstrations Sell Power

HOW rural electric cooperatives can pool their resources to help their consumer-members make more efficient use of electric power was shown at the Southwest Texas Electric Pump and Irrigation Exposition staged at Pearsall in November.

The Medina Electric Cooperative, Hondo, and Rio Grande Electric Cooperative, Brackettville, combined their efforts to line up an all-day program that presented a complete picture of modern electric irrigation methods.

Approximately 1000 people attended the exposition, including farmers in the co-ops' service area and representatives of other electric cooperatives in the state.

About 30 suppliers of motors, pumps, sprinklers, pipes and other equipment cooperated in the show. The sponsors also had the assistance of many Federal and state agencies and other groups interested in promoting the cause of electric irrigation.

**Manager D. L. Knight (left) and Director Tom Fields (standing), of Dickens County Electric Co-op, take close look at penetration test made by Harold Hodges, of USDA Soil Conservation Service.**

**Field demonstration of sprinkler system draws attention at Texas exposition.**

Demonstrations, lectures and exhibits covered the subject thoroughly, including the seeding, fertilizing, irrigation and marketing of crops.

The sponsoring co-ops arranged the program to help farmers make the best possible use of electric power. They serve a drought area where the general economy depends to a great extent on the most efficient application of deep well irrigation.


## Safety Depends on Management

THE effectiveness of an employee safety program is in direct proportion to the amount of active participation by management, REA's safety engineers remind rural electric and telephone borrowers.

In other words, they say, safety must filter down from the top—it won't percolate up from the lower ranks.

The safety engineers' contention is graphically borne out by a report made by the Bureau of Mines on a group of companies conducting safety and accident-prevention programs among their employees.

In 25 of the companies the top official attended and led all safety meetings. In this group the average accident frequency was 5.26.

At the other end of the scale were 16 companies where no top-ranking official attended the meetings. In these companies the average accident frequency was 100.

Is any further proof needed that the average worker is not inherently safety-conscious and that he requires the good example of his superiors to acquire safety-consciousness?

Co-op management is urged to take an *active* interest in job training and safety programs and not delegate the job to superintendents or foremen.

A valuable reference for managers is REA Bulletin 168-6, issued last year, entitled *Guide to Basic Safety Considerations in the Operation and Maintenance of Electric Systems.* It sets forth the minimum requirements for establishing an effective safety program and is a good check list to test the adequacy of present programs.

---

**Frank Sharrott (right) accepts gold bar marking ½-million man hours without a lost-time accident for the Joe Wheeler EMC, Hartselle, Alabama. Frank Wilson, Employers' Mutual Ins. Co. representative, makes presentation. Silver cup on table was given co-op by the Alabama Safety and Job Training group, whose help was praised by co-op Manager Floyd Anderson. Mr. Sharrott, engineer, directs co-op's safety program.**

# LIVING BETTER, FARMING BETTER

## —Electrically

**Housewife has all-electric kitchen**

**Farmer has electrified farm**

HERE'S a preview of some scenes from a 10-minute color motion picture that will be available to electric cooperatives in the spring. Purpose of the movie will be to illustrate effective uses of electricity on the farm and in the home. Cooperatives will be able to borrow film to use as a promotional aid.

Electric elevator moves heavy bales to hayloft, eliminating the hard labor.

One man works 3 hours a day to care for 20,000 birds. Electricity feeds and waters the entire flock, automatically.

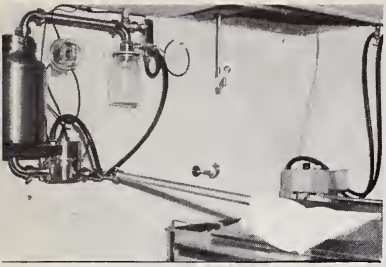
Electricity makes baking safe, economical and easy for the busy farm wife.

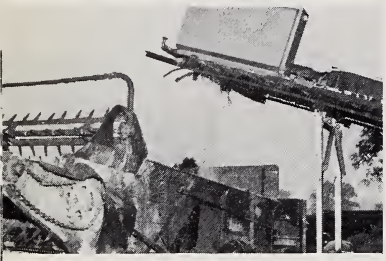
Electricity carries feed to this herd of beef cattle via a moving belt. Cattle move to lines when machinery starts.

Electricity keeps birds warm and healthy. This is heat-lamp brooder.

No wonder she smiles. Electricity makes her household duties easy and pleasant.

Picture of a man feeding a herd of beef cattle. Just flip the motor's switch.





This farm wife and her daughter milk 55 cows in 1½ hours. Electricity makes it possible. Above left, sterilizer and bulk cooler are electrically run. Lower left, electric barn cleaner carries manure from gutters directly outside to mechanical spreader.

Electricity pumps molasses from tank onto silage as it moves to cattle feeding line. Below, with help of electric wagon unloader, two men unload three tons of chopped corn in just about 7 minutes.

## Report on Condition of Electric Cooperatives: REA Finds Them

# FISCALLY FIT

A NEW and glowing picture of prosperity and financial stability for REA-financed rural electric systems emerges from the 255-page Annual Statistical Report issued recently by REA.

Supplying the individual and composite financial conditions of 967 energized systems for the calendar year 1955, the report dramatizes the greatly increased use of power on the farm and the capacity of borrower management to solve the unique problems which confront rural electric systems.

For example, operating revenues of all the reporting borrowers went up to $450 million. By comparison, the 738 borrowers in 1941 had only $35 million in operating revenues.

But what is more important, margins after depreciation rose to $59 million or 13.1 percent of operating revenues. This is double the dollar margin reported two years ago, and five times that of 1945, the first year in which borrower depreciation charges were summarized.

And while margins went up deficits went down.

In 1951, more than one quarter of all rural electric systems were in the red to the tune of close to $6 million. The current report shows but 7.6 percent failing to earn a net margin. The total deficit for the 73 borrowers was $1.9 million.

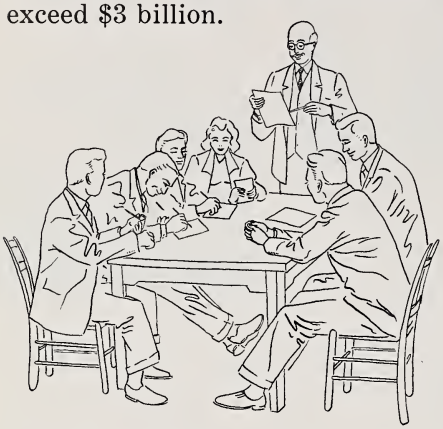
The almost sensational shift in the financial condition of electrification borrowers is ascribed to two major factors. Foremost, perhaps is a keener sense of management responsibility resulting in the creation of more realistic budgets and closer checks on operating costs. Maturity is giving REA electric borrowers more competence in operating a business.

The second major factor in the brightening picture is the increasing success of management in showing farmers the advantages


to be gained from the more effective use of power. In other words, intensive power use campaigns, carried out over a long period of time, suddenly explode into more kwh on the line and black figures on the books.

A composite balance sheet in

the annual report does even more to highlight the remarkable progress of rural electrification. It shows that the assets of REA borrowers, consisting mostly of physical plant, reached $2.6 billion dollars. If figured on a replacement basis, assets would probably exceed $3 billion.



Two other figures stand out on the balance sheet; the reserve for amortization and depreciation for all systems went past the half-billion dollar mark, and investments and special reserve funds exceeded $104 million dollars.

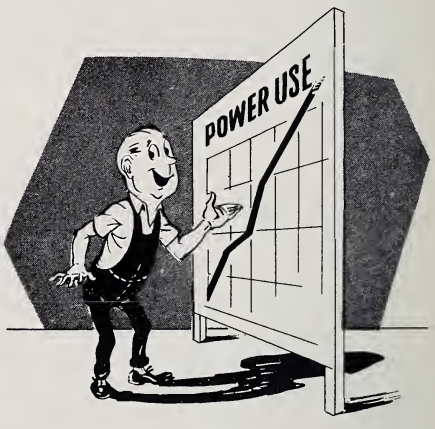
These figures take on additional importance when it is noted that, through 1955, borrowers had already returned to the government around $680 million in principal and interest, including $91 million paid in advance of the due dates.

What was the nature of the rural electric systems compiling such a unique record? Well, the typical—the median—rural electric system was serving 3510 rural consumers over 1257 miles of rural line. These are more than double the number of consumers served and miles of line operated in 1946 by the typical system.

The sources of revenue, especially as they reveal future prospects, are of considerable interest. The annual report shows that 52 percent of the revenue dollar came from service to farms, 28 percent came from non-farm residential consumers while commercial, large power and miscellaneous service contributed the remainder. The average monthly bill for residential consumers, including farms, amounted to $7.20 for an average 242 kwh, an increase over the average bill of $6.88 for an average 223 kwh the year before.

It is even more surprising that margins and revenues went up so high and so fast at a time when expenses were also rising. For example, where it cost $1909 in 1950 to build a mile of line designed to serve consumers 300 kwh a month, the same mile of line cost $2280 in 1955.

In summary, the report underlines a fundamental of utility operations; financial success is virtually assured to any rural electric system which has competent management, reliable operation and an intelligent and consistent power use program.



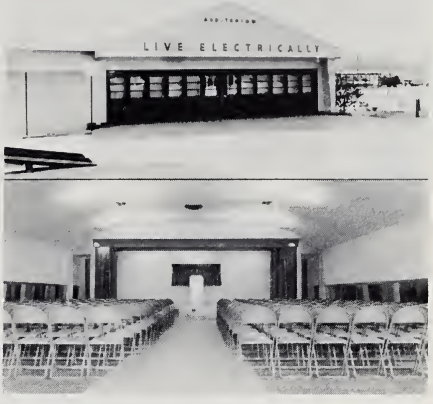
## Georgia Cooperative Provides Community Meeting Place

THE art of public relations at its best has been demonstrated by the Mitchell County Electric Membership Corporation, Camilla, Georgia, in providing an auditorium for the free use of any group or organization in its service area.

Manager Ernest G. Smith reports that the meeting place was converted at small cost from a warehouse on the co-op's grounds. The auditorium seats 525 persons for meetings and 150 for banquets. It is cooled and heated for year-round use, has stage facilities, piano, public address system, ample parking facilities—plus a modern all-electric kitchen.

During the first 10 months after its completion, the auditorium was used by more than 12,000 people in the Mitchell County EMC area.

The co-op's board of directors, who okayed the conversion when community organizations found it almost impossible to secure suitable meeting places, are happy about the friendly reaction in response to their community contribution.




**Exterior and interior views of the Mitchell County EMC Auditorium, available to any group or organization in the co-op's service area free of charge.**

## Three REA Staff Members Die in Recent Months

Three veteran members of REA's staff have died in the past several months.

**Edward C. Collier,** who served with REA since 1939, died suddenly in October. He was operations field representative in the North Central Area at the time of his death, working with the electric cooperatives in Illinois. Except for a brief period as section head at Washington headquarters, Mr. Collier had worked in the field in Illinois, Iowa, Wisconsin and northern Michigan during his entire career with REA.

**Jeter A. Harrell,** operations field representative in South Carolina in the Southeastern Area, died suddenly in November. He had served with REA since 1949. Prior to joining the REA staff, Mr. Harrell had served with other government agencies for 12 years.

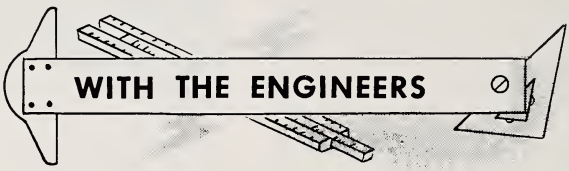
**Kenneth S. Johnson,** a consultant on REA's telephone engineering staff, died in October. Before joining the REA staff, Mr. Johnson had a long and distinguished career with the American Telephone and Telegraph Company and the Bell Telephone Laboratories. He held more than 40 U. S. patents.

## Spivey Heads REA Information

William E. Spivey has been appointed chief of REA's Information Services Division. He is a veteran of 12 years with the division.

For the three years prior to his appointment as division chief, he was head of the Current Information Section. He is a graduate of the University of Illinois School of Journalism, and before joining the REA staff had served as news editor of the East St. Louis (Ill.) Journal.

---




**System planning** determines **when, where** and **what** facilities should be provided to assure adequate service at minimum annual cost.

• • • • •

**Investment in distribution** facilities exceeds that in generation and transmission.

• • • • •

**Human behavior** represents the hazard in spite of the greater protection being built into electrical installations.

• • • • •

**Weight limitations** on bridges and roads may restrict the size and use of mobile spare substations in rural areas.

• • • • •

**Cracks in masonry walls** exposed to weather should be pointed up promptly to prevent expensive repairs.

• • • • •

**A 70-mile per hour** wind velocity will develop 12 pounds pressure per square foot on cylindrical surfaces and 20 pounds on flat surfaces.

• • • • •

*Editor's Note*—The following statement was published in this department in the November issue: "Conductor burndowns caused by loose clamps can be reduced by the use of spring-type hot line clamps." In response to a question, the engineers have modified the statement to refer to spring type hot line clamps which are **loaded by a coil spring.** Clamps made entirely of spring wire have *not* been accepted by REA.

# Telephone Advisers Report To REA Head

## Committee Lists Recommendations Following Washington Meeting

THE 17-man telephone advisory committee appointed in the fall by REA Administrator David A. Hamil has reported on the first meeting held in Washington in October.

Following is the committee's report:

### Pre-Loan Engineering

The Committee is of the opinion that in many instances pre-loan engineering has been too costly. However, it is generally agreed that the standard of pre-loan engineering now recommended by REA should not be lowered. Diligent steps should be taken to discover means of lowering the cost of preparing area coverage surveys and area coverage designs. The costs of pre-loan engineering of small exchanges is proportionally higher than in the larger exchanges, while there is less ability of the small exchange to bear the burden. It is suggested that a study be made to determine whether a separate procedure of engineering for small exchanges is practicable.

It is also suggested that the borrower furnish one or more of its employees to work with the engineer; that the larger companies consider the employment of an engineer as a staff member; and that base maps of the area be obtained from existing electric cooperatives, power companies, highway departments, and the U. S. Geological Survey.

The Committee recognizes the problem of obtaining competent and proficient engineering personnel and recommends that REA continue and accelerate its efforts to improve this situation.

In view of the importance of the problems of pre-loan engineering in the REA telephone loan program, the Committee appointed a sub-committee of engineers to study costs and other problems of pre-loan engineering and make recommendations for their relief to the Administrator. (RURAL LINES, Dec. 1956).

### Construction Specifications

The matter of plant construc-

tion specifications was discussed at length. A number of replies to the industry opinion survey said that the REA standard is too high. However, these opinions were principally from non-borrowers. The Committee is of the opinion that the standard of construction recommended by REA is reasonable and practicable and should not be lowered.

**Size and Purpose of Loans**

The matter of smaller loans for limited improvements to existing plants rather than perform a complete modernization program was discussed. The Committee is of the opinion that the costs of continuing operation of manual systems can seldom be justified and that the requirements of nationwide distant dialing and other pertinent factors in the improvement of telephone service strongly indicate the prudence of complete modernization.

**REA Control of Borrowers**

The industry survey produced some opinions that REA exercises too much control over its borrowers. These opinions came largely from non-borrowers. The Committee is of the opinion that REA does not exercise excessive controls over its borrowers and that the operating practices recommended by REA are sound and helpful.

The Committee commends REA for its program of management, accounting and engineering seminars and recommends the continuation and expansion of this program.

**Equity Requirement for Loans**

The industry survey produced a small number of complaints that the equity requirements for REA loans are too difficult. The Committee is of the opinion that generally the equity requirements are reasonable. However, it is recognized that cooperatives in some instances have a very difficult problem in meeting equity requirements, especially in acquisitions which involve urban service which is reasonably acceptable. The Committee recommends that these hardship cases receive special attention with the objective of a practicable solution to the problem.

**Compulsory Competitive Bidding**

The Committee discussed the resolution on REA loans adopted by the Board of Directors of the United States Independent Telephone Association, on October 15, 1956, with respect to purchasing central office equipment and providing force account engineering. The Committee concurs with the U.S.I.T.A. resolution and recommends that REA consider a modification of its present policy of compulsory bidding for C.O.E. as a condition for a loan, especially with respect to commercial-type borrowers with experience in purchasing. The Committee does not intend that this should eliminate competitive bidding at the option of the borrower.

It is also recommended that REA encourage borrowers having competent engineering talent to perform these services on a force account basis with the objective of lowering costs and relieving the shortage of engineering services that is now encountered.

## "Don't Damage Station Wiring", Engineers Warn

REA's telephone operations and maintenance engineers remind borrowers that troubles and maintenance expense can be built into station installations if careless fastening methods are used.

They caution that installers should be required to use staples that exactly fit the station wire, and to use the right amount of force with tackhammer or stapling gun to avoid damaging the wire.

Staples should be of the proper length to assure sufficient holding power according to the type of material on which the wire is being fastened. When stapling guns are used, the installer should be instructed how to adjust the gun to drive the staple with the right amount of force into hard or soft woods.

The engineers suggest staples with a non-corroding finish for both outside and inside use to simplify application of station wire.

---

## Farnsworth Joins REA Telephone Staff

Frank F. Farnsworth, Flanders, New Jersey, has been appointed as a consultant on REA's telephone engineering staff. He will advise on development and design of outside plant.

Mr. Farnsworth was director of outside plant development for Bell Laboratories from 1953 until his retirement in October.

The new REA consultant is a native of St. Johns, Michigan. He was graduated from Albion College in 1914 with an A.B. degree in chemistry. In 1916 he received his M.S. degree from the University of Illinois. He remained there as assistant in chemistry until his enlistment in the army in 1918.

Mr. Farnsworth joined the chemical research department of Bell Laboratories in 1921. He transferred to the outside plant development department in 1928, supervising developmental projects relating to new types of insulators, insulated wire and cable for outside distribution and station use, cable splicing methods and similar work.

During World War II he conducted military research for the Office of Scientific Research and Development, the Naval Ordnance Laboratories and the Bureau of Ships. As a result of his contributions he received a certificate of exceptional service.

---

### Scheduled Meetings of Interest to REA Telephone Borrowers

| | |
|---|---|
| Jan. 8–10 | REA Staking School, Curtis Hotel, Minneapolis, Minn. |
| Feb. 18–20 | Minnesota Telephone Assoc., Radisson Hotel, Minneapolis |
| Feb. 27–28 | Louisiana Telephone Assoc., Captain Shreve Hotel, Shreveport |
| March 5 | Kentucky Telephone Assoc., Phoenix Hotel, Lexington |
| March 21–22 | Western Assoc. of REA Borrowers, Portland, Oreg. |
| March 28–29 | Texas Telephone Assoc., Gunter Hotel, San Antonio |

UNITED STATES
GOVERNMENT PRINTING OFFICE
DIVISION OF PUBLIC DOCUMENTS
WASHINGTON 25, D. C.

OFFICIAL BUSINESS

PENALTY FOR PRIVATE USE TO AVOID
PAYMENT OF POSTAGE, $300
(GPO)

# IN FEBRUARY — — —

# PUSH *Brooders*

Is *your* cooperative ready to cash in on the national advertising and promotion behind electric chick and pig brooders?

Check your Farm Electric Power Use Calendar for things you must do in January to get these load-builders on your lines.